PB84-155712

Evaluation of the Temperature Effects on Five 1981 Passenger Vehicles

(U.S.) Environmental Protection Agency
Ann Arbor, MI

Dec 81

U.S. Department of Commerce
National Technical Information Service
NTIS

PB84-155712

EPA-AA-TEB-82-4

Evaluation of The Temperature Effects on Five 1981 Passenger Vehicles

by

Rodney J. Branham

December, 1981

Test and Evaluation Branch
Emission Control Technology Division
Office of Mobile Source Air Pollution Control
Office of Air, Noise, and Radiation
Environmental Protection Agency

REPRODUCED BY
NATIONAL TECHNICAL
INFORMATION SERVICE
U.S. DEPARTMENT OF COMMERCE
SPRINGFIELD, VA. 22161

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO.	2.	3. RECIPIENT'S ACCESSION NO.
EPA-AA-TEB-82-4		PB84 155712

4. TITLE AND SUBTITLE
Evaluation of the Temperature Effects On Five 1981 Passenger Vehicles.

5. REPORT DATE
December 1981

6. PERFORMING ORGANIZATION CODE

7. AUTHOR(S)
Rodney J. Branham

8. PERFORMING ORGANIZATION REPORT NO.

9. PERFORMING ORGANIZATION NAME AND ADDRESS
U.S. Environmental Protection Agency
Office of Mobile Sources
Test and Evaluation Branch
Ann Arbor, MI 48105

10. PROGRAM ELEMENT NO.

11. CONTRACT/GRANT NO.

12. SPONSORING AGENCY NAME AND ADDRESS

13. TYPE OF REPORT AND PERIOD COVERED
Technical

14. SPONSORING AGENCY CODE

15. SUPPLEMENTARY NOTES
Disclaimer: Some pages are illegible

16. ABSTRACT

This report summarizes the results of a study done to evaluate how 1981 model year motor vehicle emission systems react to ambient temperatures. Five different vehicles with mileages between 500 and 700 miles were tested using the EPA Cold Environmental Test Cell (CETC). Each vehicle was tested according to the Federal Test Procedure (FTP) and the Highway Fuel Economy Test (HFET) at ambient temperatures of 20°, 60°, 75°, and 100°F. The results show that the lower the ambient temperature is, the higher the emissions levels for city driving are. In addition, ambient temperatures do not affect exhaust emission levels drastically for highway driving.

Degrees

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Ambient Temperature Exhaust Emissions Motor Vehicles Tests Temperature	Federal Test Procedures Highway Fuel Economy Test Cold Weather Temperatures Hot Weather Temperatures	

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)*	21. NO. OF PAGES
Release Unlimited	unclassified	18
	20. SECURITY CLASS *(This page)* unclassified	22. PRICE

EPA Form 2220-1 (9-73)

Background

The present Federal Test Procedures (FTP) and Highway Fuel Economy Test (HFET) are run at temperatures between 68°F and 86°F. Because emission standards are based on these test procedures the emission control systems are somewhat tailored to be most effective in the 68° to 86°F tolerance. There is some question as to how well such emission control systems work at ambient temperatures outside of the FTP tolerances. While extensive testing of late model vehicles has been performed in the past, the improvements, refinements, and new technology introduced on new vehicles requires a periodic reassessment as to the emission characteristics of new vehicles at various temperatures. This project tested five (5) 1981 vehicles with mileages between 500 and 7200 miles, at 20°, 60°, 75°, and 100°F. The results will give an overview of how 1981 model year production vehicles emission systems react to varying ambient conditions.

Test Procedures

Using the EPA Cold Environmental Test Cell (CETC) exhaust emissions were collected according to the Federal Test Procedure (FTP) and the Highway Fuel Economy Test (HFET) procedures. Five (5) different vehicles were used to conduct the testing. Vehicle Identification sheets are attached for all five (5) vehicles. Each vehicle ran a valid FTP and HFET at 20°, 60°, 75°, and 100°F. The CETC is a room that is capable of testing as low as 20°F and as high as 100°F. The dynamometer is a Labeco Electric dynamometer. A vehicle can be tested by means of a forced cooldown to lower fluid level temperatures to 20°F in approximately 4 to 5 hours or by a 12-36 hour soak at the test temperature. Previous testing has shown no discernible differences between the two preconditioning methods for either fuel economy or emissions. The room is closed off with the vehicle inside.

Test Results

The attached graphs show the changes in emission levels at different temperatures. On the attached computer readout it can be noted that emission levels were reduced and fuel economy increased as the temperature increased. In the (HFET) test, emission levels and fuel economy were not affected as drastically as in the FTP.

Conclusions

- The lower the ambient temperature is, the higher the emission levels for city driving are.
- Driveability of all vehicles was good at all temperatures tested.
- Ambient temperatures do not affect emission levels drastically for expressway driving.

VEHICLE.ID B3BK26B4BC184143
TEST.PROCEDURE CVS.75-LATR

TEST.NUMBER	TEST.DATE	DRY.BULB	UNRD.GPM.HC	UNRD.GPM.CO	UNRD.GPM.NOX	UGTD.MI/GALLON
810713	03-81-09	22.0	1.73432	27.8086	1.1753	18.2396
810711	02-81-09	59.0	.32677	6.5117	1.2063	19.9164
810697	01-81-09	72.5	.25211	5.6309	1.0150	20.5926
810734	02-81-09	97.0	.18463	3.7482	.8802	21.1912

VEHICLE.ID B3BK26B4BC184143
TEST.PROCEDURE HWFE

TEST.NUMBER	TEST.DATE	DRY.BULB	UNRD.GPM.HC	UNRD.GPM.CO	UNRD.GPM.NOX	UGTD.MI/GALLON
810712	03-81-09	29.0	.03147	.1378	1.0273	30.8651
810710	02-81-09	59.5	.01582	.0380	.9487	31.1038
810698	01-81-09	72.5	.01465	.0475	.9877	30.0486
810733	02-81-09	100.5	.01633	.2190	.9396	32.3186

VEHICLE.ID 1FABP082XBW20356
TEST.PROCEDURE CVS.75-LATR

TEST.NUMBER	TEST.DATE	DRY.BULB	UNRD.GPM.HC	UNRD.GPM.CO	UNRD.GPM.NOX	UGTD.MI/GALLON
810849	17-81-09	23.0	1.80119	21.1745	.9185	23.0352
810826	16-81-09	58.5	.44350	4.3669	.6856	26.5294
810822	15-81-09	75.0	.42787	4.4442	.5790	26.7648
810824	17-81-09	98.0	.40001	5.3256	.4784	27.4857

VEHICLE.ID 1FABP082XBW20356
TEST.PROCEDURE HWFE

TEST.NUMBER	TEST.DATE	DRY.BULB	UNRD.GPM.HC	UNRD.GPM.CO	UNRD.GPM.NOX	UGTD.MI/GALLON
810829	16-81-09	21.0	.14453	.9379	.7397	39.0774
810827	16-81-09	59.0	.12728	1.0207	.6019	41.2460
810823	15-81-09	73.0	.12791	1.0789	.5327	41.2273
810825	17-81-09	98.0	.13271	1.5465	.5045	41.0832

VEHICLE.ID 1FABP21B3BK15310
TEST.PROCEDURE CVS.75-LATR

TEST.NUMBER	TEST.DATE	DRY.BULB	UNRD.GPM.HC	UNRD.GPM.CO	UNRD.GPM.NOX	UGTD.MI/GALLON
810575	26-81-08	22.2	3.49503	70.3328	.2791	15.2215
810573	25-81-08	59.0	.13139	.8699	.3343	16.6762
810569	20-81-08	74.0	.17919	1.2058	.2327	16.4082
810571	24-81-08	100.0	.14956	1.3643	.2406	17.8572

VEHICLE.ID 1FABP21B3BK15310
TEST.PROCEDURE HWFE

TEST.NUMBER	TEST.DATE	DRY.BULB	UNRD.GPM.HC	UNRD.GPM.CO	UNRD.GPM.NOX	UGTD.MI/GALLON
810574	26-81-08	23.0	.06995	.1532	.1173	21.7112
810572	25-81-08	58.0	.04913	.0441	.1364	21.9933
810568	20-81-08	74.0	.07043	.1522	.1192	22.2004
810570	24-81-08	100.0	.08272	.1948	.1294	23.8031

VEHICLE.ID 1G1AX68X7B621755
TEST.PROCEDURE CVS.75-LATR

TEST.NUMBER	TEST.DATE	DRY.BULB	UNRD.GPM.HC	UNRD.GPM.CO	UNRD.GPM.NOX	UGTD.MI/GALLON
810752	24-81-09	22.0	1.68618	12.8613	.8072	18.2263
810750	22-81-09	60.5	.48657	5.5896	.6933	20.2316
810746	14-81-09	75.0	.32595	4.6558	.5624	21.0466
810748	21-81-09	101.5	.26477	3.3283	.5257	21.6785

VEHICLE.ID 1G1AX68X7B621755
TEST.PROCEDURE HWFE

TEST.NUMBER	TEST.DATE	DRY.BULB	UNRD.GPM.HC	UNRD.GPM.CO	UNRD.GPM.NOX	UGTD.MI/GALLON
810753	24-81-09	22.0	.03318	.6198	.2934	30.8909
810751	22-81-09	60.5	.02763	1.0268	.1891	31.3685
810747	14-81-09	75.0	.03137	1.4175	.1890	31.5222
810749	21-81-09	101.5	.05357	2.3297	.1718	32.2673

VEHICLE.ID 2G1AW69J6B144479
TEST.PROCEDURE CVS.75-LATR

TEST.NUMBER	TEST.DATE	DRY.BULB	UNRD.GPM.HC	UNRD.GPM.CO	UNRD.GPM.NOX	UGTD.MI/GALLON
811194	04-81-11	18.7	1.76180	28.1024	.7193	16.2198
811188	22-81-10	60.0	.36482	2.6478	.7796	18.5400
811180	20-81-10	73.6	.32814	2.3968	.6917	18.9566
811184	19-81-10	100.7	.23896	1.7240	.5712	19.7745

VEHICLE.ID 2G1AW69J6B144479
TEST.PROCEDURE HWFE

TEST.NUMBER	TEST.DATE	DRY.BULB	UNRD.GPM.HC	UNRD.GPM.CO	UNRD.GPM.NOX	UGTD.MI/GALLON
811195	04-81-11	20.0	.07772	.3343	.4348	28.0845
811189	22-81-10	61.5	.06633	.2494	.4003	28.0103
811181	21-81-10	73.6	.06139	.1198	.4013	27.9415
811185	19-81-10	100.5	.06528	.0545	.3736	28.0384

DATE JAN 20, 1982

VEHICLE SPECIFICATION REPORT - - DATE OF ENTRY : 3/23/81

VEHICLE SPECIFICATIONS

MANUFACTURER	VEHICLE ID / VER	REPRESENTED CARLINE	MODEL CODE	DRIVE CODE	SOURCE
CHRYSLER	B38K26B4BC184143 0		SEDAN	FRONT DRIVE STR. LEFT	OTHER

VEHICLE TYPE	ACTUAL VEHICLE MODEL	MODEL YEAR	ACTIVE YEAR	DRIVE AXL WTS FULL TANK	DRIVE AXL WTS EMPTY TANK	CURB WEIGHT	INRTIA CLASS	EQUIV. TEST WEIGHT	O/D CODE	ACTUAL DYNO HP	RUNNING CHG NUMBER
NON-CER	CHRYSLER	81	81	1630P		2450P	2750P	2750P		7.1	

PRIMARY DURABILITY VEHICLE ID OR ASSIGNED DF	ALT. MANUFACTURER

TIRE - SPECIFICATIONS

TIRE & RIM SIZES	MFR	CONSTR	SWL N	SWL M	BLT N	BLT M	PSI FT	PSI RR
P175/70R13	GOODYEAR	RADIAL	1 P	3 0	35	35		

ENGINE SPECIFICATIONS

DISPLACEMENT	BORE	STROKE	RATED HP	ENGINE TYPE	ENGINE CONFIGURATION	NO. CYL.	NO. CARBS	TOTAL # BBLS	FUEL SYSTEM MFR/MODEL	FUEL INJCT?	TURBO?	COMP. RATIO	COAST-DOWN TM
135. E	3.44E	3.62E	90	OTTO SPARK	IN-LINE	4	1	2		NO	NO	8.5	

IGNITION TIMING 1	IGNITION TIMING 2	TIM. TOL.	TIMING RPM	RPM TOL.	TIM. GEAR	% CO LEFT	% CO RIGHT	% CO COMB.	CO TOL.	IDLE RPM	IDLE TOL.	IDLE GEAR	ENGINE FAMILY	ENGINE CODE
10d		10	900	900				.0		840		NEUTRAL	BCR2.2V2	

DRIVE TRAIN AND CONTROL SYSTEM SPECIFICATIONS

AXLE RATIO	N/V RATIO	ODOMETER	A/C INSTALLED	EXHAUST TYPE	CRANKCASE SYSTEM	TRANSMISSION CONFIGURATION	TRANSMISSION CODE	EVAPORATION SYSTEM	FUEL TYPE
2.78	.	MILES	YES	SINGLE LEFT REAR	CLOSED	AUTO	AUTO	CANISTER	UNLEADED (AT EPA-IND HO)

MAIN-TANK CAPACITY	MAIN-TANK VOLUME	AUX.-TANK CAPACITY	AUX.-TANK VOLUME	SHIFT SPEED	EVAPORATIVE EMISSION FAMILY	EVAPORATIVE EMISSION CODE	SALES CLASS
13. G	5.2G				BCRKH	A	

CONTROL SYSTEM TYPES

EXHAUST RECYCLE	AIR PUMP	OXIDATION CATALYST	THREE-WAY CATALYST	CLOSED LOOP

VEHICLE SPECIFICATION COMMENTS

ACTUAL VEHICLE ID =1B38K26B4BC184143

DATE JAN 20, 1982

VEHICLE SPECIFICATION REPORT - - DATE OF ENTRY : 4/ 8/81

VEHICLE SPECIFICATIONS

MANUFACTURER	VEHICLE ID / VER	REPRESENTED CARLINE	MODEL CODE	DRIVE CODE	SOURCE
FORD	1FABP082XBW20356 0		STATION WA	FRONT DRIVE STR. LEFT	OTHER

VEHICLE TYPE	ACTUAL VEHICLE MODEL	MODEL YEAR	ACTIVE YEAR	DRIVE AXL WTS FULL TANK	DRIVE AXL WTS EMPTY TANK	CURB WEIGHT	INRTIA CLASS	EQUIV. TEST WEIGHT	O/D CODE	ACTUAL DYNO HP	RUNNING CHG NUMBER
NON-CER	FORD ESCORT	81	81	1360P		2195P	2500P	2500P		7.1	

PRIMARY DURABILITY VEHICLE ID OR ASSIGNED DF

ALT. MANUFACTURER

TIRE - SPECIFICATIONS

TIRE & RIM SIZES	MFR	CONSTR	SWL N	SWL M	BLT N	BLT M	PSI FT	PSI RR
P155/80R13	MICHELIN	RADIAL	1	R	1	R	45	

ENGINE SPECIFICATIONS

DISPLACEMENT	BORE	STROKE	RATED HP	ENGINE TYPE	ENGINE CONFIGURATION	NO. CYL.	NO. CARBS	TOTAL # BBLS	FUEL SYSTEM MFR/MODEL	FUEL INJCT?	TURBO?	COMP. RATIO	COAST-DOWN TM
1.6M	80.00M	79.50M	87	OTTO SPARK	IN-LINE	4	1	2	MOTORCRAFT	NO	NO	.	

IGNITION TIMING 1	IGNITION TIMING 2	TIM. TOL.	TIMING RPM	RPM TOL.	TIM. GEAR	% CO LEFT	% CO RIGHT	% CO COMB.	CO TOL.	IDLE RPM	IDLE TOL.	IDLE GEAR	ENGINE FAMILY	ENGINE CODE
10B			900									NEUTRAL	E1EE-9C485-GB	

DRIVE TRAIN AND CONTROL SYSTEM SPECIFICATIONS

AXLE RATIO	N/V RATIO	ODOMETER	A/C INSTALLED	EXHAUST TYPE	CRANKCASE SYSTEM	TRANSMISSION CONFIGURATION	TRANSMISSION CODE	EVAPORATION SYSTEM	FUEL TYPE
.	.	MILES	YES	SINGLE LEFT REAR	CLOSED	M-4		CANISTER	UNLEADED (AT EPA-NO HC)

MAIN-TANK CAPACITY	MAIN-TANK VOLUME	AUX.-TANK CAPACITY	AUX.-TANK VOLUME	SHIFT SPEED	EVAPORATIVE EMISSION FAMILY	EVAPORATIVE EMISSION CODE	SALES CLASS
10.0G	4.0G			DO NOT SHIFT MANUALLY	CM		

EXHAUST RECYCLE	AIR PUMP	CONTROL SYSTEM TYPES		
		OXIDATION CATALYST	CLOSED LOOP	

VEHICLE SPECIFICATION COMMENTS

DATE JAN 20, 1982

VEHICLE SPECIFICATION REPORT - - DATE OF ENTRY : 4/ 8/81

VEHICLE SPECIFICATIONS

MANUFACTURER	VEHICLE ID / VER	REPRESENTED CARLINE	MODEL CODE	DRIVE CODE	SOURCE
FORD	1FABP21838K15310 0		SEDAN	REAR DRIVE STR. LEFT	OTHER

VEHICLE TYPE	ACTUAL VEHICLE MODEL	MODEL YEAR	ACTIVE YEAR	DRIVE AXL WTS FULL TANK	DRIVE AXL WTS EMPTY TANK	CURB WEIGHT	INRTIA CLASS	EQUIV. TEST WEIGHT	O/D CODE	ACTUAL DYNO HP	RUNNING CHG NUMBER
NON-CER	FORD FAIRMONT	81	81	1250P		2895P	3500P	3375P		11.1	

PRIMARY DURABILITY VEHICLE ID OR ASSIGNED DF | ALT. MANUFACTURER

TIRE - SPECIFICATIONS

TIRE & RIM SIZES	MFR	CONSTR	SWL FR	SWL RR	BLT FR	BLT RR	PSI FR	PSI RR
P175/75R14	BF GOODRICH	RADIAL	2	P	2	S		

ENGINE SPECIFICATIONS

DISPLACEMENT	BORE	STROKE	RATED HP	ENGINE TYPE	ENGINE CONFIGURATION	NO. CYL.	NO. CARBS	TOTAL # BBLS	FUEL SYSTEM MFR/MODEL	FUEL INJCT?	TURBO?	COMP. RATIO	COAST-DOWN TM
3.3M	.	.		OTTO SPARK	IN-LINE	6	1		MOTORCRAFT	NO	NO	.	

IGNITION TIMING 1	IGNITION TIMING 2	TIM. TOL.	TIMING RPM	RPM TOL.	TIM. GEAR	% CO LEFT	% CO RIGHT	% CO COMB.	CO TOL.	IDLE RPM	IDLE TOL.	IDLE GEAR	ENGINE FAMILY	ENGINE CODE
10B			900									NEUTRAL	E1BE-9C485-BA	

DRIVE TRAIN AND CONTROL SYSTEM SPECIFICATIONS

AXLE RATIO	N/V RATIO	ODOMETER	A/C INSTALLED	EXHAUST TYPE	CRANKCASE SYSTEM	TRANSMISSION CONFIGURATION	TRANSMISSION CODE	EVAPORATION SYSTEM	FUEL TYPE
.	.	MILES	YES		CLOSED	A-3		CANISTER	UNLEADED (AT EPA-IND HO)

MAIN-TANK CAPACITY	MAIN-TANK VOLUME	AUX.-TANK CAPACITY	AUX.-TANK VOLUME	SHIFT SPEED	EVAPORATIVE EMISSION FAMILY	EVAPORATIVE EMISSION CODE	SALES CLASS
.				DO NOT SHIFT MANUALLY	AM		

CONTROL SYSTEM TYPES

EXHAUST RECYCLE	AIR PUMP	THREE-WAY CATALYST	NONE	NONE

VEHICLE SPECIFICATION COMMENTS

DATE JAN 20, 1982

VEHICLE SPECIFICATION REPORT - - DATE OF ENTRY : 4/ 8/81

VEHICLE SPECIFICATIONS

MANUFACTURER	VEHICLE ID / VER	REPRESENTED CARLINE	MODEL CODE	DRIVE CODE	SOURCE
GENERAL MOTORS	1G1AX68X7B621755 0	12020	SEDAN	FRONT DRIVE STR. LEFT	OTHER

VEHICLE TYPE	ACTUAL VEHICLE MODEL	MODEL YEAR	ACTIVE YEAR	DRIVE AXL WTS FULL TANK	DRIVE AXL WTS EMPTY TANK	CURB WEIGHT	INRTIA CLASS	EQUIV. TEST WEIGHT	O/D CODE	ACTUAL DYNO HP	RUNNING CHG NUMBER
NON-CER	CHEVROLET CITATION	81	81			2705P	3000P	3000P		7.3	

PRIMARY DURABILITY VEHICLE ID OR ASSIGNED DF

ALT. MANUFACTURER

TIRE - SPECIFICATIONS

TIRE & RIM SIZES	MFR	CONSTR	SHL N	BLT M	PSI N	M FT	RR
P185/80R13	UNIROYAL						45

ENGINE SPECIFICATIONS

DISPLACEMENT	BORE	STROKE	RATED HP	ENGINE TYPE	ENGINE CONFIGURATION	NO. CYL.	NO. CARBS	TOTAL # BBLS	FUEL SYSTEM MFR/MODEL	FUEL INJCT?	TURBO?	COMP. RATIO	COAST-DOWN TM
2.8M	89.00M	76.00M		OTTO SPARK	V-BLOCK	6	1	2		NO	NO	•	

IGNITION TIMING 1	IGNITION TIMING 2	TIM. TOL.	TIMING RPM	RPM TOL.	TIM. GEAR	% CO LEFT	% CO RIGHT	% CO COMB.	CO TOL.	IDLE RPM	IDLE TOL.	IDLE GEAR	ENGINE FAMILY	ENGINE CODE
													11C2NDM	

DRIVE TRAIN AND CONTROL SYSTEM SPECIFICATIONS

AXLE RATIO	N/V RATIO	ODOMETER	A/C INSTALLED	EXHAUST TYPE	CRANKCASE SYSTEM	TRANSMISSION CONFIGURATION	TRANSMISSION CODE	EVAPORATION SYSTEM	FUEL TYPE
•	•	MILES	YES		CLOSED	A-3		CANISTER	UNLEADED (AT EPA-IND MO)

MAIN-TANK CAPACITY	MAIN-TANK VOLUME	AUX.-TANK CAPACITY	AUX.-TANK VOLUME	SHIFT SPEED	EVAPORATIVE EMISSION FAMILY	EVAPORATIVE EMISSION CODE	SALES CLASS
14.0G	5.6G			DO NOT SHIFT MANUALLY	185-1	101	

CONTROL SYSTEM TYPES

EXHAUST RECYCLE

PULSATING AIR SYSTEM

OXIDATION CATALYST

CLOSED LOOP

VEHICLE SPECIFICATION COMMENTS

∞

DATE JAN 20, 1982

VEHICLE SPECIFICATION REPORT - - DATE OF ENTRY : 4/ 8/81

VEHICLE SPECIFICATIONS

MANUFACTURER	VEHICLE ID / VER	REPRESENTED CARLINE	MODEL CODE	DRIVE CODE	SOURCE
GENERAL MOTORS	2G1AW69J6B144479 0	12030	SEDAN	REAR DRIVE STR. LEFT	OTHER

VEHICLE TYPE	ACTUAL VEHICLE MODEL	MODEL YEAR	ACTIVE YEAR	DRIVE AXL WTS FULL TANK	DRIVE AXL WTS EMPTY TANK	CURB WEIGHT	INRTIA CLASS	EQUIV. TEST WEIGHT	O/D CODE	ACTUAL DYNO HP	RUNNING CHG NUMBER
NON-CER	CHEVEROLET MALIBU	81	81	1470P		3445P	3500P	3625P		11.1	

PRIMARY DURABILITY VEHICLE ID OR ASSIGNED DF

ALT. MANUFACTURER

TIRE - SPECIFICATIONS

TIRE & RIM SIZES	MFR	CONSTR	SWL N	SWL M	BLT N	BLT M	PSI FT	PSI RR
P195/75R14	UNIROYAL	RADIAL	1	S	3	P	45	

ENGINE SPECIFICATIONS

DISPLACEMENT	BORE	STROKE	RATED HP	ENGINE TYPE	ENGINE CONFIGURATION	NO. CYL.	NO. CARBS	TOTAL # BBLS	FUEL SYSTEM MFR/MODEL	FUEL INJCT?	TURBO?	COMP. RATIO	COAST-DOWN TM
267.0E	3.50E	3.48E		OTTO SPARK	V-BLOCK	8	1	2	GM 210	NO	NO	8.3	

IGNITION TIMING 1	IGNITION TIMING 2	TIM. TOL.	TIMING RPM	RPM TOL.	TIM. GEAR	% CO LEFT	% CO RIGHT	% CO COMB.	CO TOL.	IDLE RPM	IDLE TOL.	IDLE GEAR	ENGINE FAMILY	ENGINE CODE
6B			500									DRIVE	11D2AC	

DRIVE TRAIN AND CONTROL SYSTEM SPECIFICATIONS

AXLE RATIO	N/V RATIO	ODOMETER	A/C INSTALLED	EXHAUST TYPE	CRANKCASE SYSTEM	TRANSMISSION CONFIGURATION	TRANSMISSION CODE	EVAPORATION SYSTEM	FUEL TYPE
*	*	MILES	YES		CLOSED	A-3		CANISTER	UNLEADED (AT EPA-IND NO)

MAIN-TANK CAPACITY	MAIN-TANK VOLUME	AUX.-TANK CAPACITY	AUX.-TANK VOLUME	SHIFT SPEED	EVAPORATIVE EMISSION FAMILY	EVAPORATIVE EMISSION CODE	SALES CLASS
18.1G	7.2G			DO NOT SHIFT MANUALLY	1R3S-1	9	

CONTROL SYSTEM TYPES

EXHAUST RECYCLE

AIR PUMP

OXIDATION CATALYST

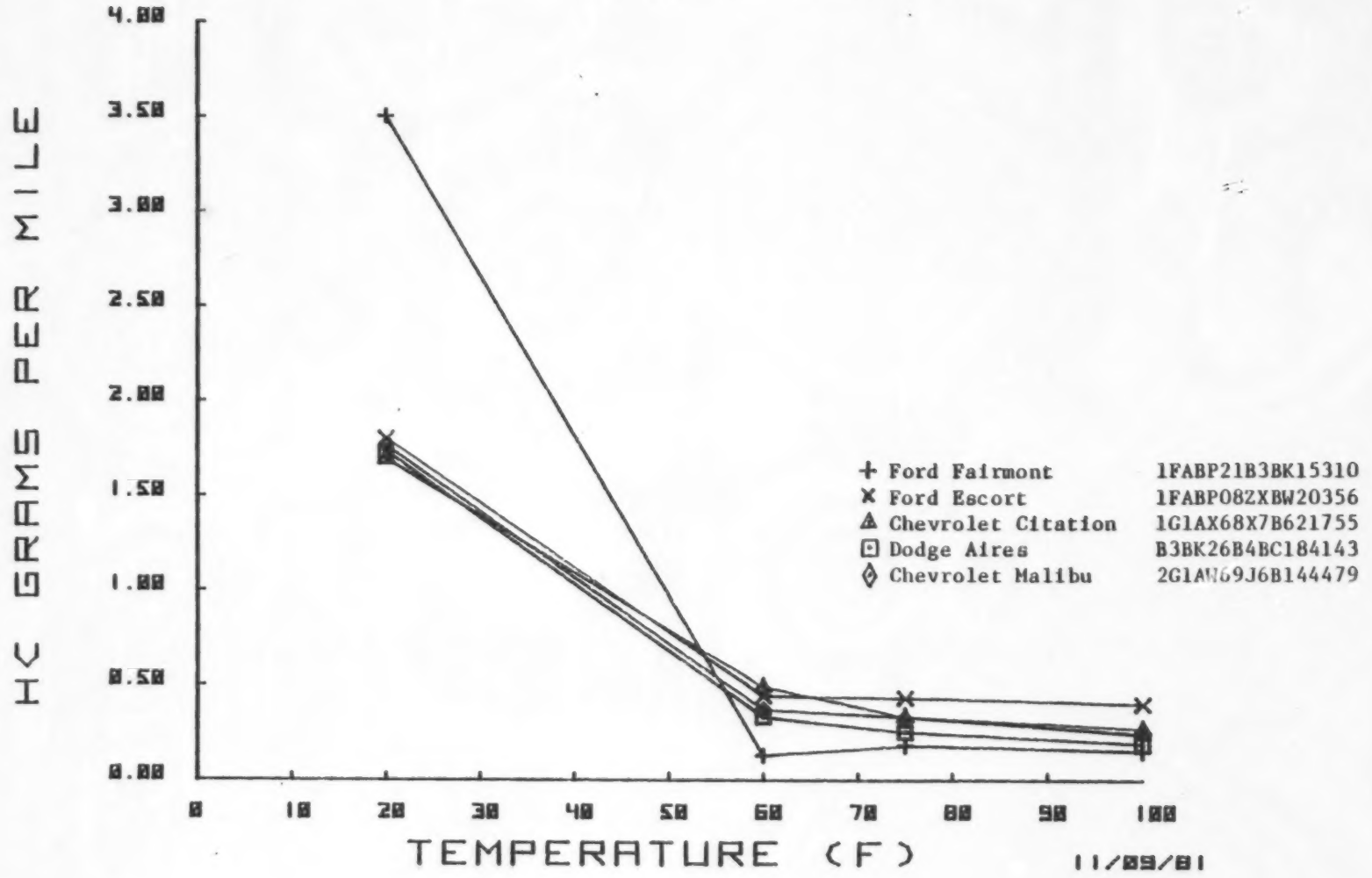
THREE-WAY CATALYST

CLOSED LOOP

VEHICLE SPECIFICATION COMMENTS

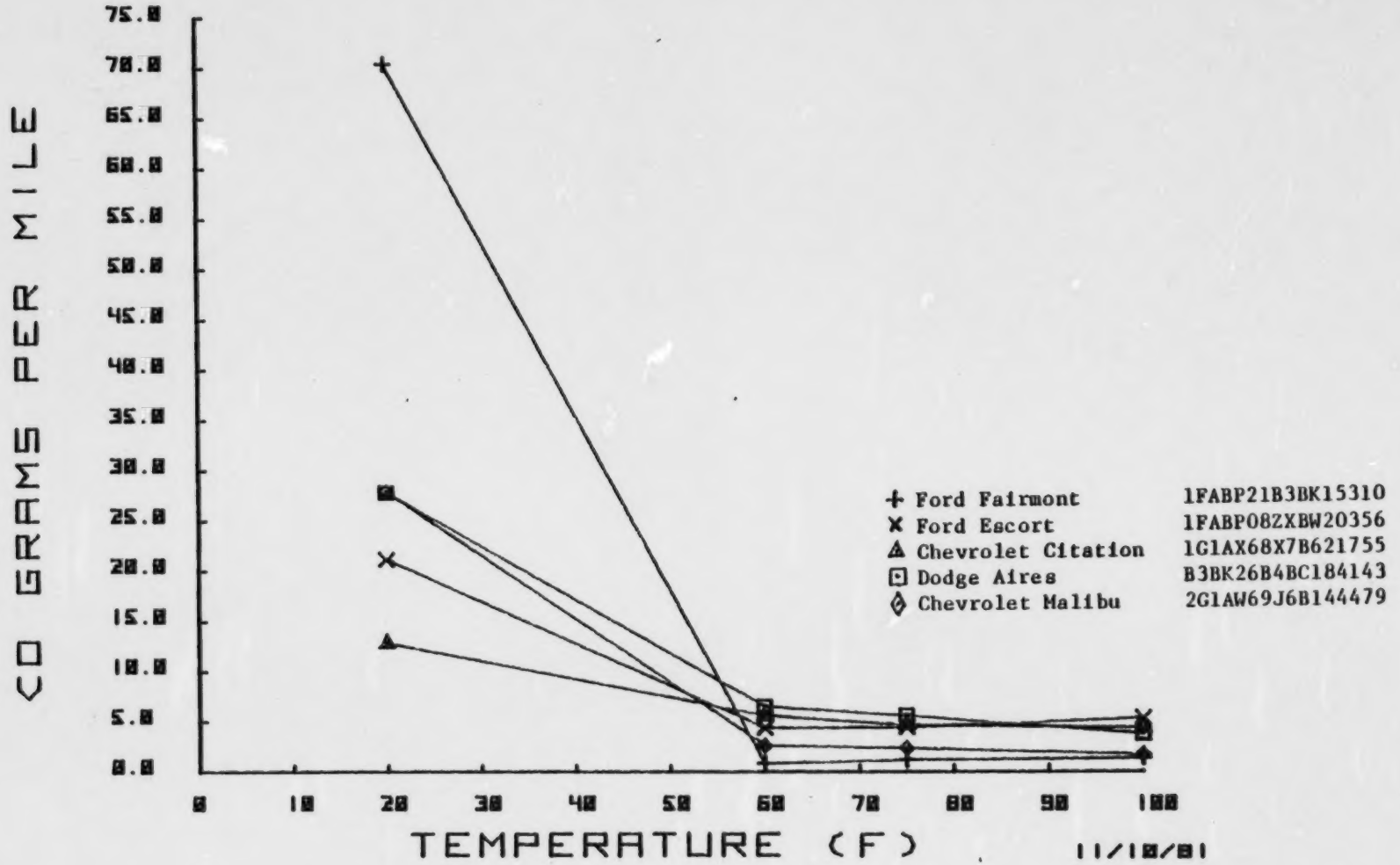
6

CETC DATA SUMMARY
FTP HC VS TEMPERATURE



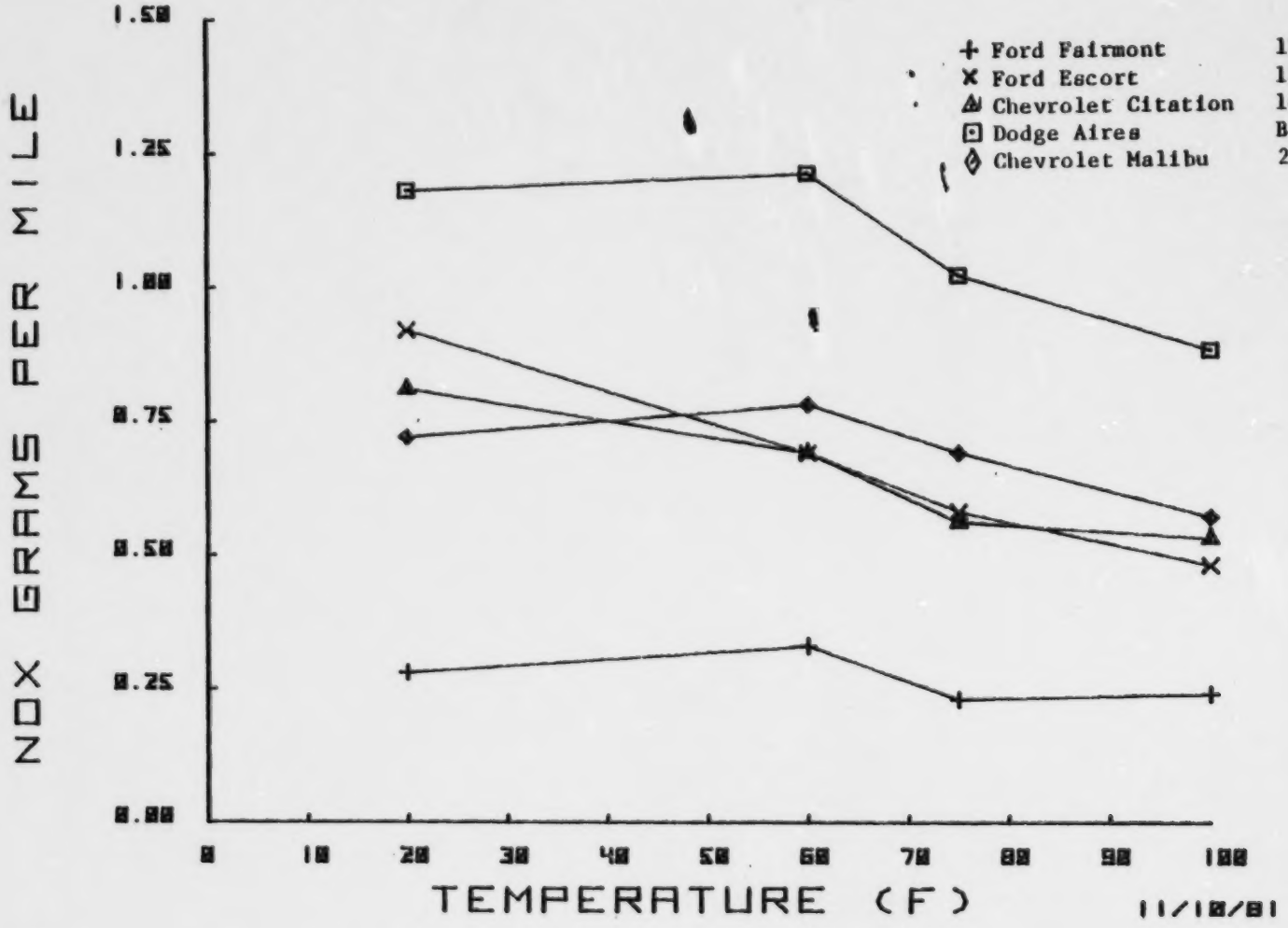
CETC DATA SUMMARY

FTP CO VS TEMPERATURE



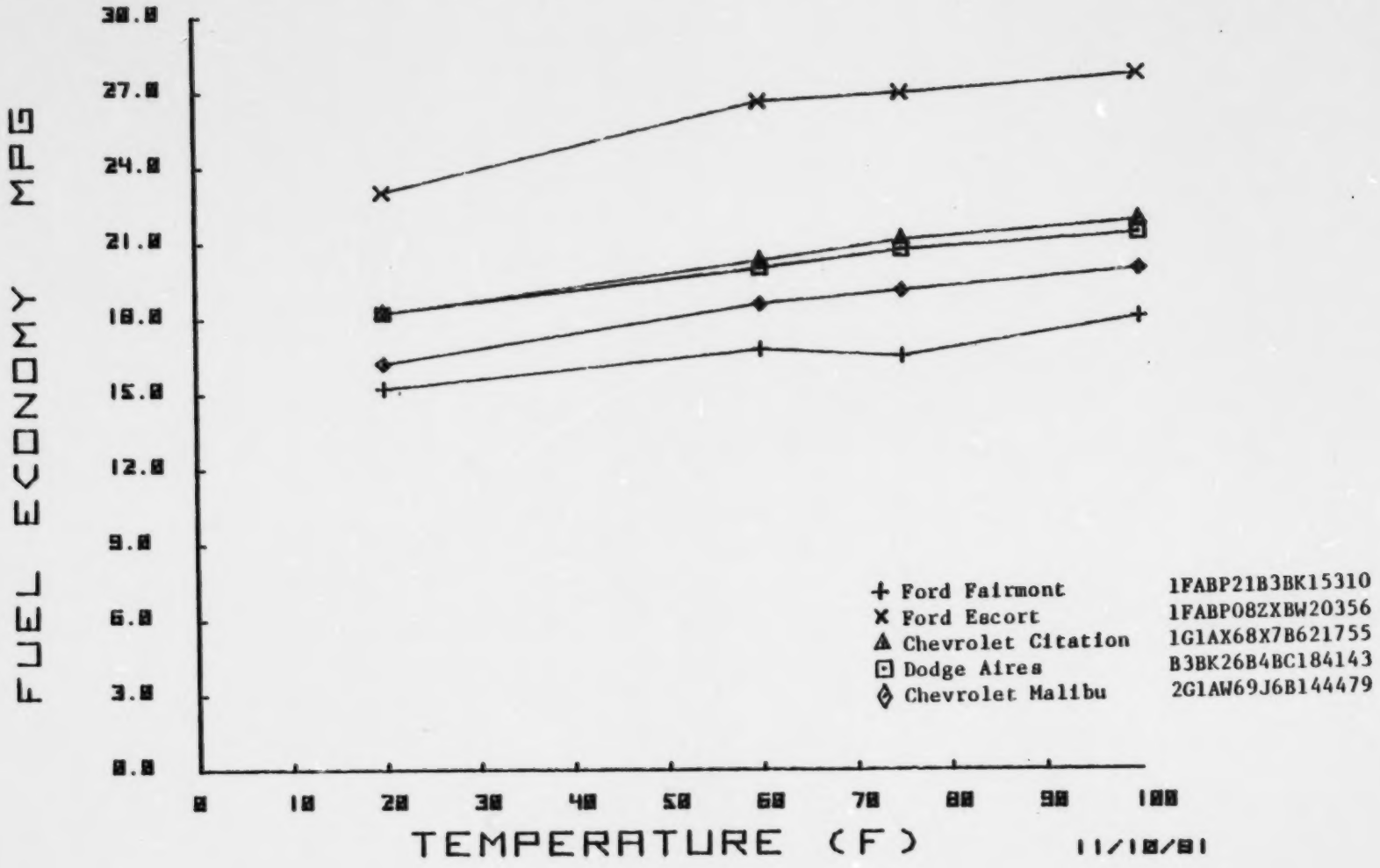
CETC DATA SUMMARY

FTP NOX VS TEMPERATURE

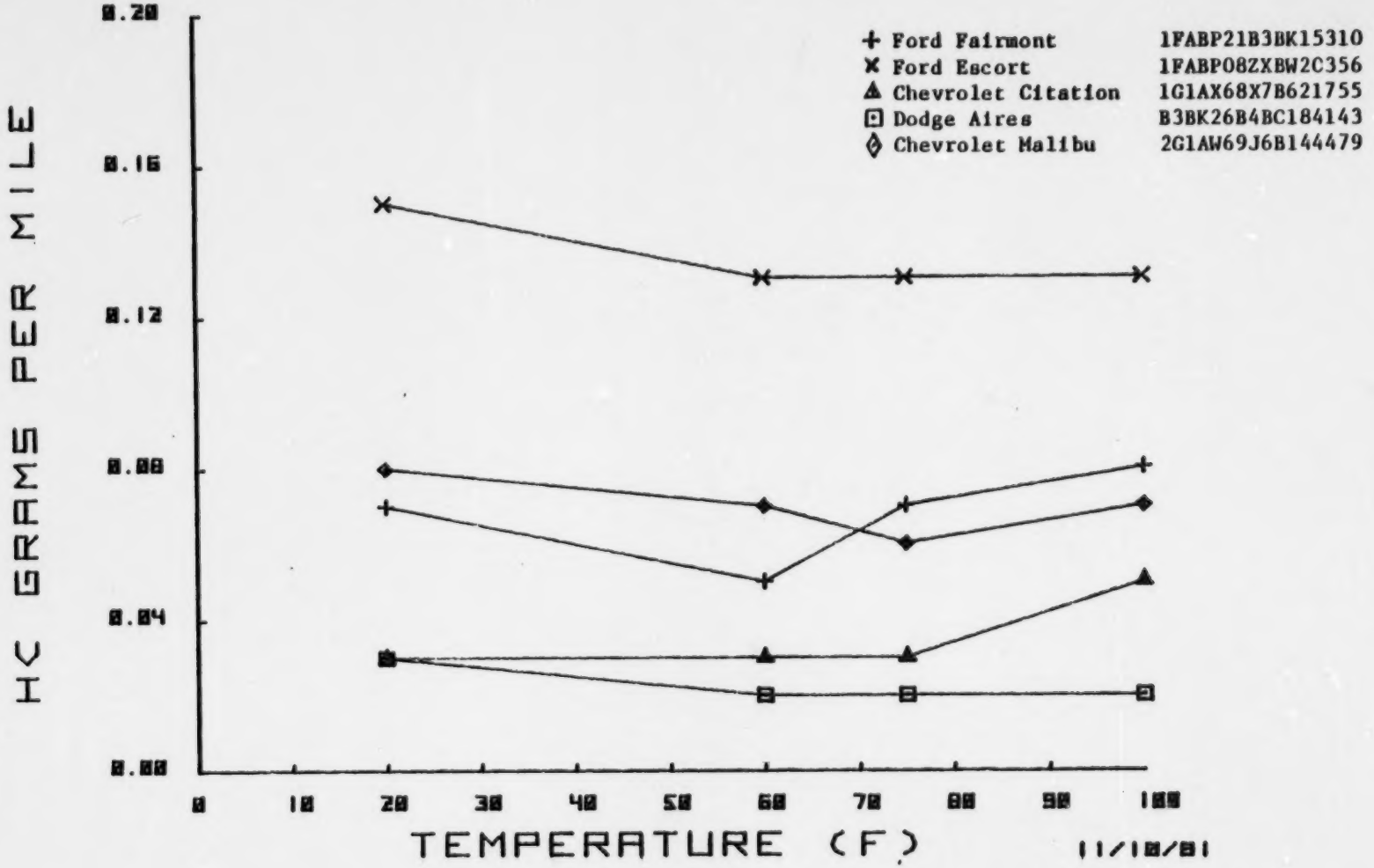


CETC DATA SUMMARY

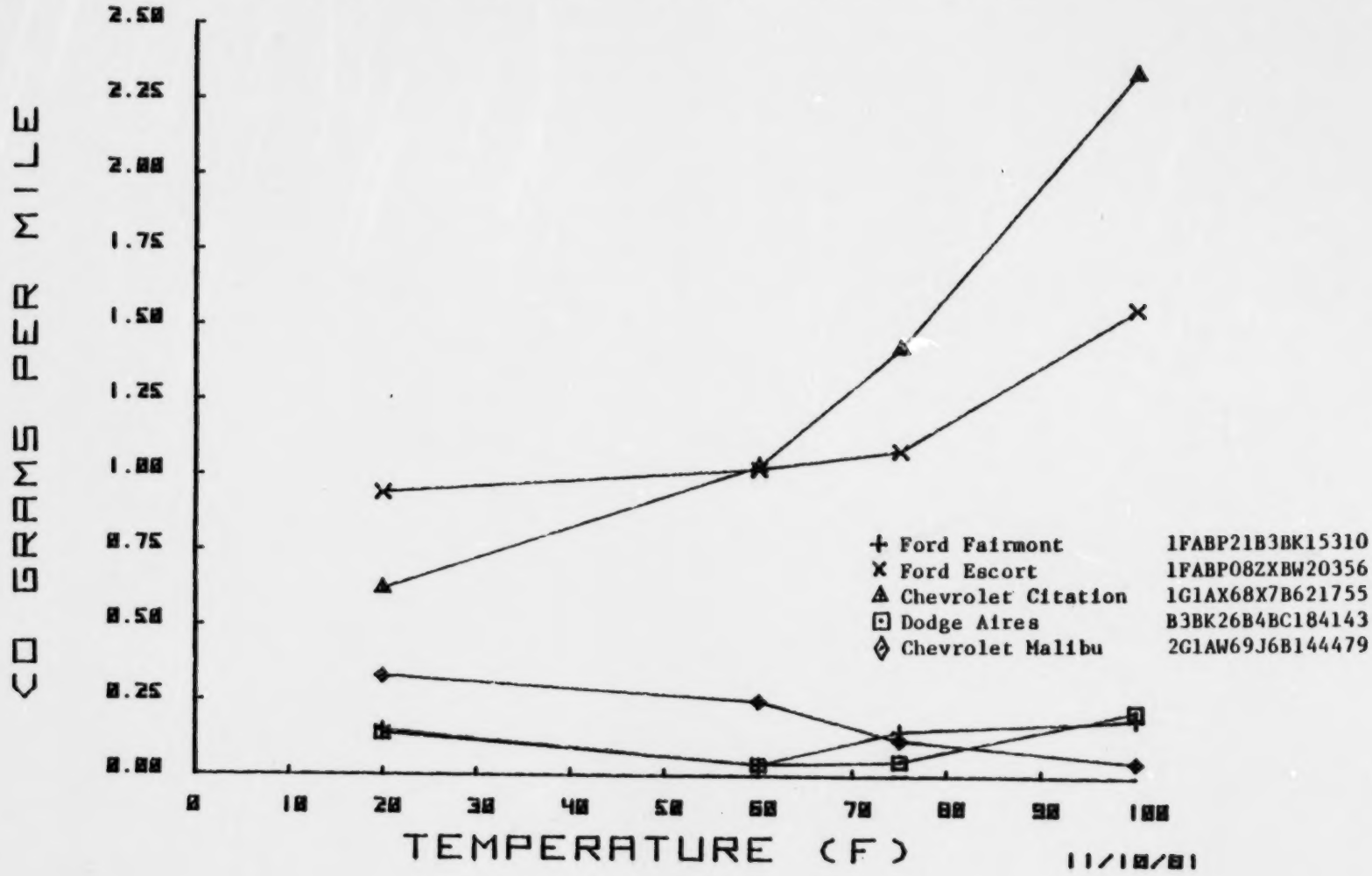
FTP MPG VS TEMPERATURE



CETC DATA SUMMARY
FET HC VS TEMPERATURE

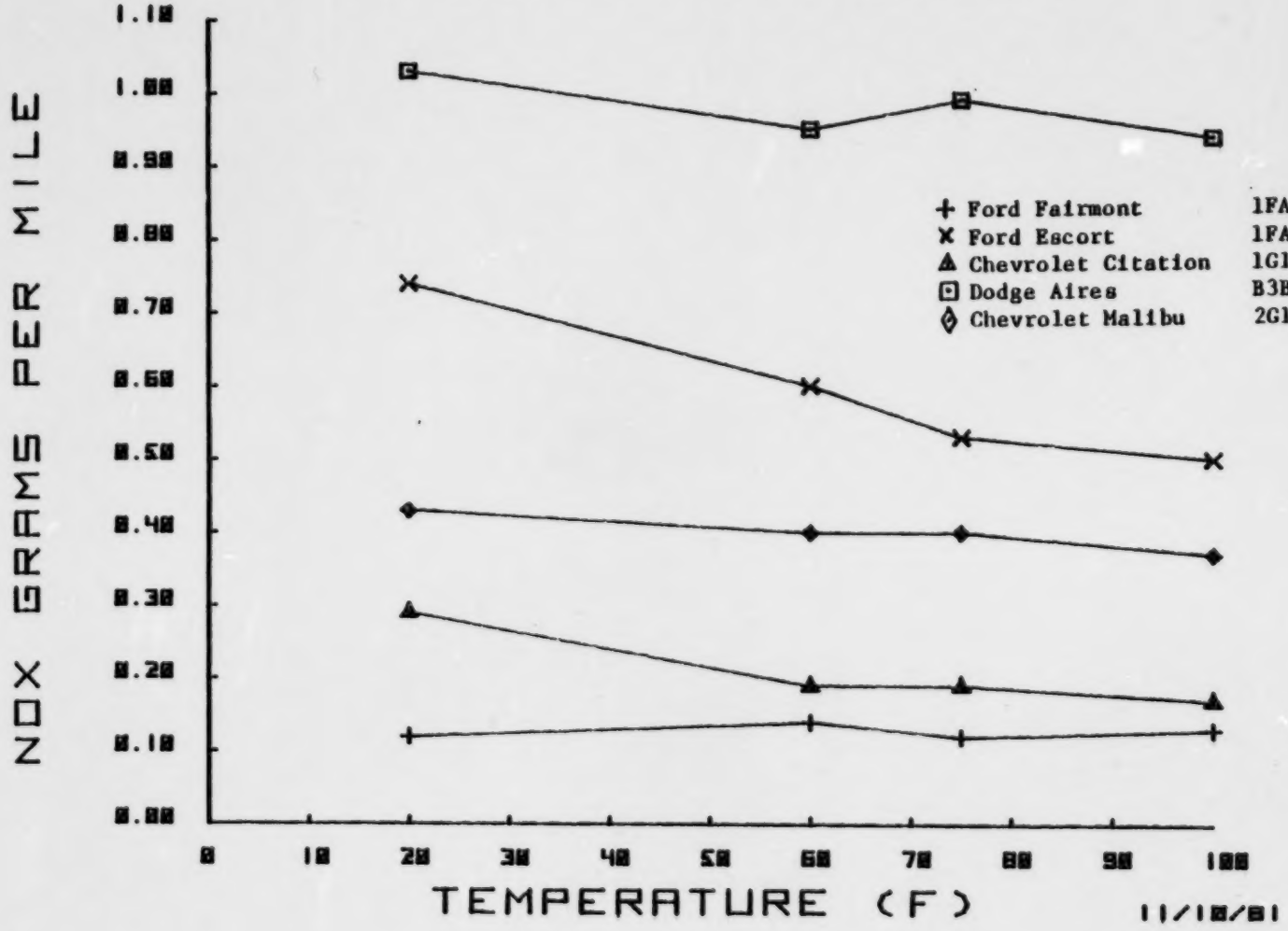


CETC DATA SUMMARY
FET CO VS TEMPERATURE



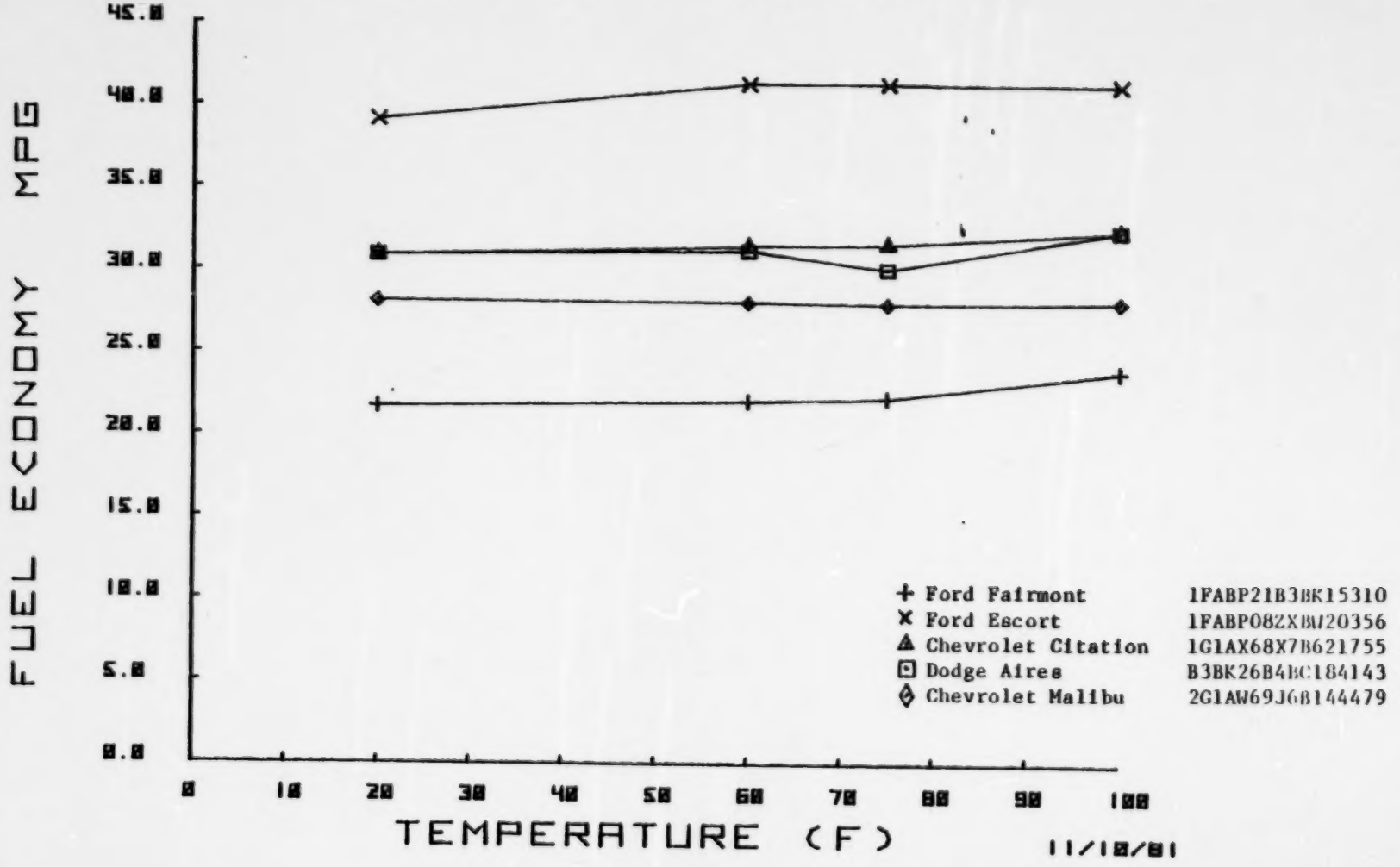
CETC DATA SUMMARY

FET NOX VS TEMPERATURE



CETC DATA SUMMARY

FET MPG VS TEMPERATURE



CETC DATA SUMMARY

FET MPG VS TEMPERATURE